

REMARKS

At the time of the Office Action dated April 14, 2003, claims 2-6, 13 and 16-18 were pending and rejected in this application. Claims 2, 5, 13 and 16-17 have been amended. Applicants submit that the present Amendment does not generate any new matter issue.

Claims 13 and 17 are rejected under 35 U.S.C. § 102 for lack of novelty based upon Tsuda et al., U.S. Patent No. 6,262,783 (hereinafter Tsuda)

In the fourth enumerated paragraph of the Office Action, the Examiner asserted that Tsuda discloses a reflection type liquid crystal display and method of making the same according to that claimed. This rejection is respectfully traversed.

In the statement of the rejection that Examiner asserted that Tsuda discloses a device structure in which unevenness is formed in the reflex picture element region and a metal contact hole formed in the TFT region comparable to the features recited in claims 13 and 17. Claims 13 and 17, as amended, each recite that an interlayer insulating material having a sensitivity to i-line of 365nm in wavelength and h-line of 405nn in wavelength. Tsuda, however, fails to teach or suggest using a material satisfying the above-recited limitations. Thus, Tsuda fails to identically disclose the invention as recited in claims 13 and 17.

Furthermore, claim 13 recites that a semiconductor film is composed of the same film as the semiconductor layer. This semiconductor film is formed in the picture element region

excluding the region where scanning line, signal line and contact hole are formed. Tsuda, however, does not disclose any film equivalent to the mentioned semiconductor film.

Applicants also note that the unevenness disclosed in Tsuda is created by:

forming an auxiliary capacity pattern, which is the same layer as gate signal line, having removed pattern portion such as a circular one in the picture element region;

forming unevenness by exposing a positive type photo-sensitive resin on the surface to the light from backside (Fig. 4a); and

forming the unevenness as a separable pattern 420 (Fig. 4c).

In the claimed invention on the other hand, a photosensitive resin is formed as an inseparable pattern by exposure from front side using a photo mask, as well as forming an a-Si pattern in the picture element region in order to block scattered light reflected from the backside. Thus, there are significant differences between Tsuda and the claimed invention. Applicants, therefore, respectfully solicit the withdrawal of the imposed rejection of claims 13 and 17 under 35 U.S.C. § 102 for lack of novelty based upon Tsuda.

Claims 2 and 4 are rejected under 35 U.S.C. § 103 for obviousness predicated upon Tsuda in view of Takatsu et al., U.S. Patent No. 5,434,026 (hereinafter Takatsu)

In the sixth enumerated paragraph of the Office Action, the Examiner concluded that one having ordinary skill in the art would have been motivated to modify the methodology and mask of Tsuda in view of Takatsu to arrive at the claimed invention. This rejection is respectfully traversed.

According to the method described in Tsuda, unevenness of the picture element is formed by backside exposure using the auxiliary capacity metal pattern of the gate layer formed on the substrate as a mask. On the other hand, according to the claimed invention, any pattern formed on the substrate is not used as a mask, which is different from that disclosed by Tsuda.

Takatsu discloses a method for optimizing the focus conditions at the time of exposure of stepper using a projection lens having a small depth of focus and large opening. This method of Takatsu makes it possible to increase the exposure intensity of the light shading part of the mask from 0 to 20. In contrast, the inseparable pattern of the claimed invention for forming unevenness of the picture element and the separable pattern for forming the contact hole are divided in exposure, and the exposure of the inseparable pattern is reduced to 20% to 80% of the exposure amount of the separable pattern. In this manner, the inseparable pattern is formed without removing the positive type photosensitive resin up to the bottom side, which is neither taught nor suggested by Takatsu.

For example, in the upper part of Fig. 1(c) of Takatsu, a sectional view of a resultant resist image is shown. This is a separable pattern (not an inseparable pattern) showing a result of reduction in thickness of the resist at the light shading part of the mask. Applicants note that the term inseparable pattern does not mean the remaining pattern. The inseparable pattern, according to the claimed invention, means a case where a resist (located at the part of the exposure portion al in Fig. 1(c) of Takatsu) remains as a result of half exposure, and the separable pattern means another case where the resist is fully removed. Thus, even if Tsuda and Takatsu were combined, such a combination would not teach or suggest that claimed invention

as recited in claims 2 and 4. Furthermore, Applicants note that the Examiner's asserted motivation to modify Tsuda in view of Takatsu does not appear to be derived from either Tsuda or Takatsu, and it is well settled law that the requisite motivation to combine must be found in the applied prior art. Applicants, therefore, respectfully solicit the withdrawal of the imposed rejection of claims 2 and 4 under 35 U.S.C. § 103 for obviousness based upon Tsuda in view of Takatsu.

Claims 3, 5, 16 and 18 are rejected under 35 U.S.C. § 103 for obviousness based upon Tsuda in view of Kiryu et al., U.S. Patent No. 5,368,962 (hereinafter Kiryu)

In the seventh enumerated paragraph of the Office Action, the Examiner concluded that one having ordinary skill in the art would have been motivated to modify the methodology and mask of Tsuda in view of Kiryu to arrive at the claimed invention. This rejection is respectfully traversed.

According to the method described in Tsuda, unevenness of the picture element is formed by backside exposure using the auxiliary capacity metal pattern of the gate layer formed on the substrate as a mask. On the other hand, according to the claimed invention, any pattern formed on the substrate is not used as a mask, which is different from that disclosed by Tsuda. Furthermore, Tsuda fails to teach or suggest that an amorphous silicon pattern is formed in picture element region, as recited in claim 5.

Applicants note that Kiryu discloses employment of a filter of which transmittance is about 50% with respect to a light of 500 to 570nm in wavelength. On the other hand, as recited

in claims 5 and 16, an interlayer insulating material is formed using a UV filter of which UV transmittance is 20 to 80% with respect to a positive type acrylic resin having a sensitivity to i-line of 365nm in wavelength and h-line of 405nm in wavelength. Neither Tsuda nor Kiryu discloses the use of the mentioned UV cut filter satisfying the above-described limitations. Furthermore, with regard to claim 5, the film thickness of the amorphous Si film forming the UV filter is recited as being between 1nm to 10nm. However, neither Tsuda nor Kiryu discloses a UV filter meeting this limitation. Applicants, therefore, respectfully solicit the withdrawal of the imposed rejection of claims 3, 5, 16 and 18 under 35 U.S.C. § 103 for obviousness based upon Tsuda in view of Kiryu.

Claim 6 is rejected under 35 U.S.C. § 103 for obviousness based upon Tsuda in view of Kiryu and Aggas et al., U.S. Patent No. 5,994,157 (hereinafter Aggas)

In the eighth enumerated paragraph of the Office Action, Examiner concluded that one having ordinary skill in the art would have been motivated to modify the methodology and mask of Tsuda in view of Kiryu and Aggas to arrive at the claimed invention.

Aggas discloses a SiN film of an amorphous Si film of rich Si, which has a thickness of 100 angstroms to 2000 angstroms, thereby enabling the film to cut an UV light of 365nm in wavelength by not less than about 80%. However, Aggas fails to teach or suggest that the transmittance of 20 % to 80% is established with respect to a h-line of 405nm in wavelength. Furthermore, the claimed thickness of the amorphous Si film, as recited in claim 5 is not disclosed by Aggas. Still further, the use of a Cr/CrO_x as a light shading material for completely cutting UV is not disclosed by any of Tsuda, Kiryu and Aggas. Applicants, therefore,

respectfully solicit the withdrawal of the imposed rejection of claim 6 under 35 U.S.C. § 103 for obviousness based upon Tsuda in view of Kiryu and Aggas.

Applicants have made every effort to present claims which distinguish over the prior art, and it is believed that all claims are in condition for allowance. However, Applicants invite the Examiner to call the undersigned if it is believed that a telephonic interview would expedite the prosecution of the application to an allowance. Accordingly, and in view of the foregoing remarks, Applicants hereby respectfully request reconsideration and prompt allowance of the pending claims.

To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417, and please credit any excess fees to such deposit account.

Respectfully submitted,

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